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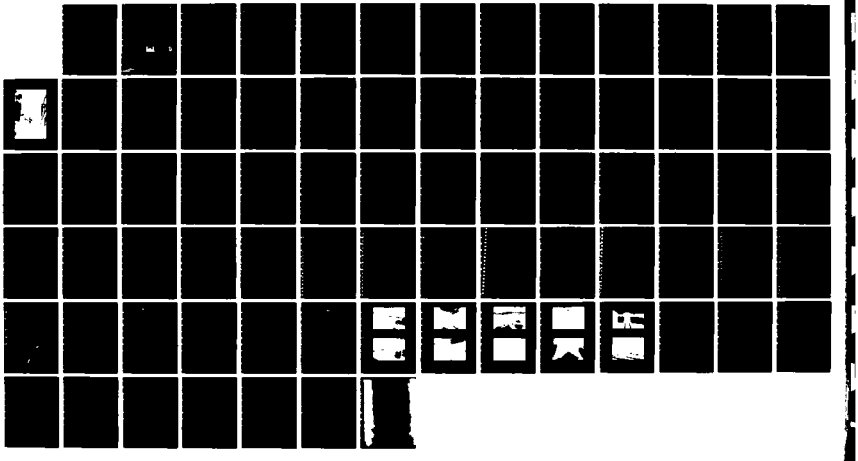

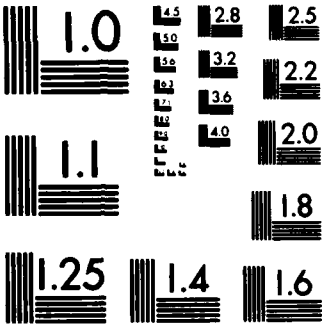

HOUSATONIC RIVER BASIN

SHELTON, CONNECTICUT

SHELTON RES. NO. 2 DAM
CT 00093

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

SEPTEMBER 1980

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM
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4. TITLE (and Subtitle): Housatonic River Basin Shelton, Conn., Shelton Res. No. 2 Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS	5. TYPE OF REPORT & PERIOD COVERED: INSPECTION REPORT
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s): U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION	8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
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18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,
Housatonic River Basin
Shelton, Conn.
Shelton Res. No.2 Dam

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Shelton Reservoir No. 2 Dam is a stone masonry and earth embankment structure approx. 150 ft. long and 23 ft. high. A majority of the downstream face of the dam is stone masonry on a 1:3 slope. On portions of the dam where the downstream face is earth, the slope is 1:1. The spillway is located in the center of the dam is 32 ft. long. A wooden bridge spans the spillway with its underside approx. 3 ft. above the spillway crest. There is an upper and lower gate house for the control of a water main. This reservoir has been out of service for some time, and the water main has been abandoned and plugged.

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DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02254

REPLY TO
ATTENTION OF:

NEDED-E

DEC 19 1980

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

Inclosed is a copy of the Shelton Reservoir No. 2 Dam (CT-00093) Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. The report is based upon a visual inspection, a review of past performance, and a preliminary hydrological analysis. A brief assessment is included at the beginning of the report.

The preliminary hydrologic analysis has indicated that the spillway capacity for the Shelton Reservoir No. 2 Dam would likely be exceeded by floods greater than 21% percent of the Probable Maximum Flood (PMF), the test flood for spillway adequacy. Our screening criteria specifies that a dam of this class which does not have sufficient spillway capacity to discharge fifty percent of the PMF, should be adjudged as having a seriously inadequate spillway and the dam assessed as unsafe, non-emergency, until more detailed studies prove otherwise or corrective measures are completed.

The term "unsafe" applied to a dam because of an inadequate spillway does not indicate the same degree of emergency as that term would if applied because of structural deficiency. It does indicate, however, that a severe storm may cause overtopping and possible failure of the dam, with significant damage and potential loss of life downstream.

It is recommended that within twelve months from the date of this report the owner of the dam engage the services of a professional or consulting engineer to determine by more sophisticated methods and procedures the magnitude of the spillway deficiency. Based on this determination, appropriate remedial mitigating measures should be designed and completed within 24 months of this date of notification. In the interim a detailed emergency operation plan and warning system should be promptly developed. During periods of unusually heavy precipitation, round-the-clock surveillance should be provided.

DEC 1 6 '8

NEDED-E
Honorable Ella T. Grasso

I have approved the report and support the findings and recommendations described in Section 7, with qualifications as noted above. I request that you keep me informed of the actions taken to implement these recommendations since this follow-up is an important part of the non-Federal Dam Inspection Program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. This report has also been furnished to the owner of the project, Bridgeport Hydraulic Company, 835 Main Street, Bridgeport, Connecticut.

Copies of this report will be made available to the public, upon request to this office, under the Freedom of Information Act, thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for the cooperation extended in carrying out this program.

Sincerely,

WILLIAM E. HODGSON, JR.
Colonel, Corps of Engineers
Acting Division Engineer

SHELTON RESERVOIR NO. 2 DAM

CT 00093

HOUSATONIC RIVER BASIN

SHELTON, CONNECTICUT

PHASE I INSPECTION REPORT

NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM

PHASE I INSPECTION REPORT

Identification Number:	CT 00093
Name:	Shelton Reservoir No. 2 Dam
Town:	Shelton
County and State:	Fairfield County, Connecticut
Stream:	Curtiss Brook
Date of Inspection:	June 10, 1980

BRIEF ASSESSMENT

Shelton Reservoir No. 2 Dam is a stone masonry and earth embankment structure approximately 150 feet long and 23 feet high. A majority of the downstream face of the dam is stone masonry on a 1:3 slope. On portions of the dam where the downstream face is earth, the slope is 1:1. The spillway is located in the center of the dam and is 32 feet long. A wooden bridge spans the spillway with its underside approximately 3 feet above the spillway crest. There is an upper and lower gate house for the control of a water main. This reservoir has been out of service for some time, and the water main has been abandoned and plugged. A 12-inch low level discharge pipe passes through the base of the dam and is located below the spillway. The control for this discharge pipe is on the upstream face, but is not operable. The drainage area is 1.3 square miles and the reservoir has 109 acre-feet of available storage.

The assessment of the dam is based on the visual inspection, past operational performance and hydraulic/hydrologic computations. The dam is judged to be in fair condition with several areas that require attention. These areas include seepage through the dam and the spillway training walls, vegetation on the embankments and along the toe of the dam and the non-operating status of the discharge pipe.

The dam is classified as small and has a high hazard potential in accordance with guidelines established by the Corps of Engineers. The test flood outflow for this dam is 1,280 cfs and corresponds to 1/2 the probable maximum flood. The test flood outflow will overtop the dam by 1.5 feet.

It is recommended that the owner engage the services of a qualified registered engineer experienced in the design of dams to investigate the seepage through the dam and the training walls; the removal of trees on the downstream embankment and along the toe of the dam; prepare a detailed hydraulic/hydrologic study to determine the spillway's adequacy; repair the upstream retaining wall and repair the discharge valve. It is also recommended that the owner remove vegetation from the embankment; clear the spillway channel of debris; repair the bridge over the spillway; repair all joints and cracked concrete; establish a formal warning system and initiate an annual technical inspection program.

The owner should implement the recommendations and remedial measures described above and in greater detail in Section 7 within one year after receipt of this Phase I Inspection Report.

Joseph F. Merluzzo
Connecticut P.E. #7639
Project Manager

Gary J. Giroux
Connecticut P.E. #11477
Project Engineer

This Phase I Inspection Report on Shelton Res. No. 2 Dam (CT-00093) has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

ARAMAST MAHTESIAN, MEMBER
Geotechnical Engineering Branch
Engineering Division

CARNEY M. TERZIAN, MEMBER
Design Branch
Engineering Division

RICHARD DIBUONO, CHAIRMAN
Water Control Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Inspections. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Inspection is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Inspection; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I Inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established guidelines, the Spillway Test Flood is based on the estimated Probable Maximum Flood for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and variety of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies considering the size of the dam, its general condition and the downstream damage potential.

The Phase I Inspection does not include an assessment of the need for fences, gates, "no trespassing" signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with Occupational Safety and Health Administration's (OSHA) rules and regulations is also excluded.

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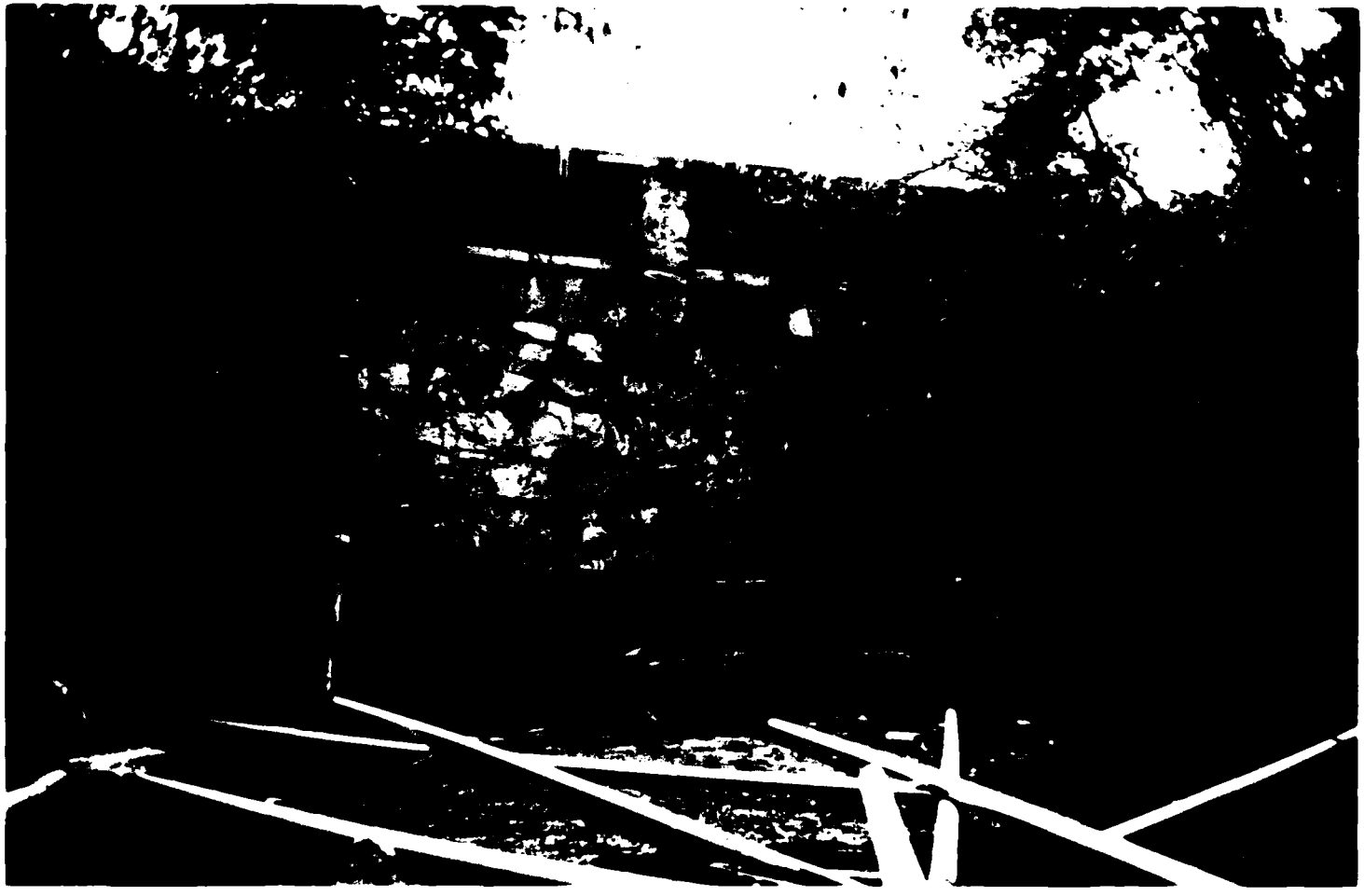
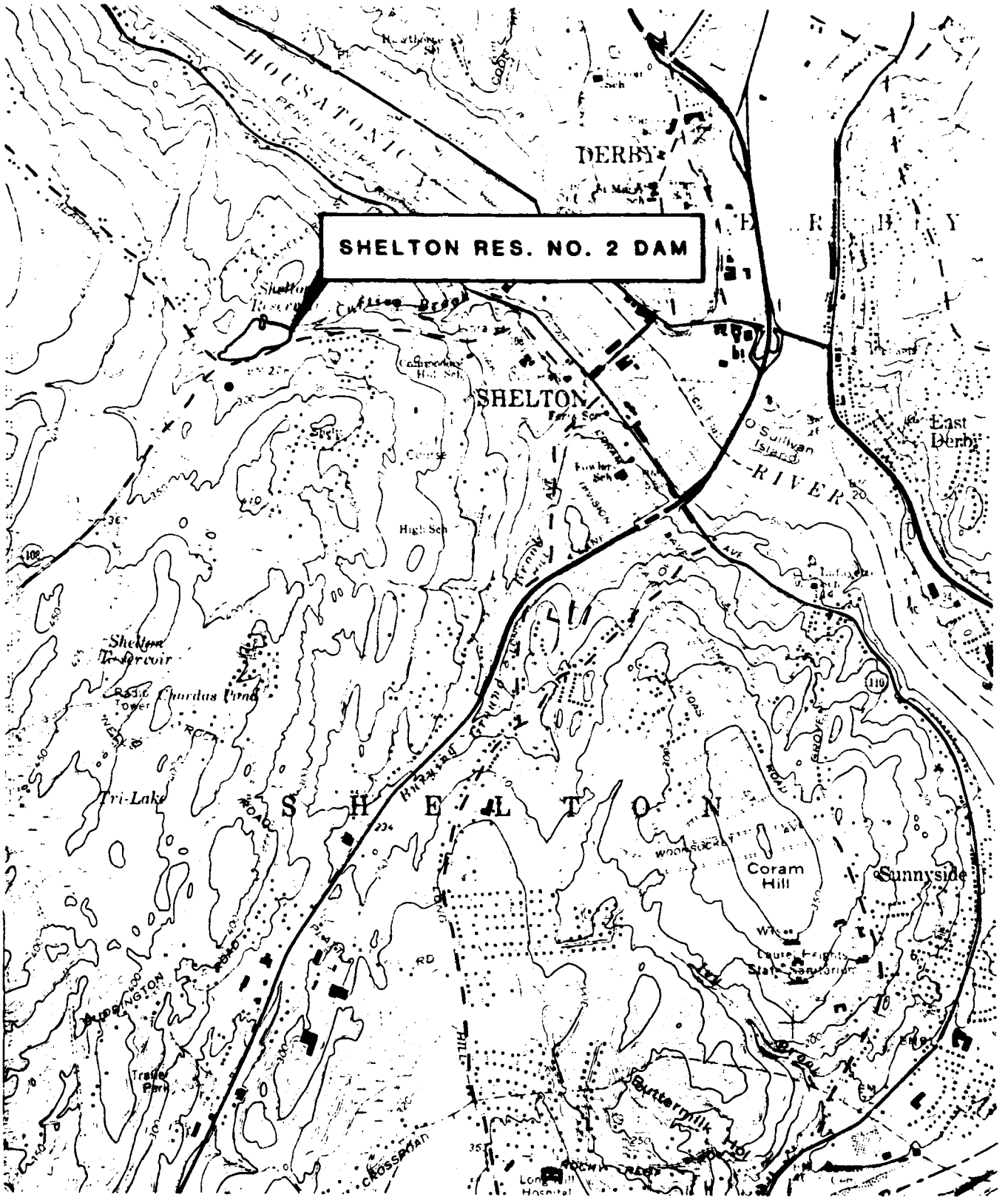


SHELTON RESERVOIR NO. 2 DAM



QUADRANGLE: **ANSONIA**

US ARMY, CORPS OF ENGINEERS
NEW ENGLAND DIVISION
WALTHAM, MASS.

SCALE IN FEET
2000' 0 2000' 4000'
1" = 2000'

LOCATION MAP

PHASE I INSPECTION REPORT

SHELTON RESERVOIR NO. 2 DAM CT 00093

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority - Public Law 92-367, August 8, 1972 authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Storch Engineers has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed were issued to Storch Engineers under a letter of March 6, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-80-C-0035 has been assigned by the Corps of Engineers for this work.

b. Purpose of Inspection -

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and prepare the states to initiate quickly effective dam safety programs for non-Federal dams.

(3) To update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location - Shelton Reservoir No. 2 Dam is located in the Town of Shelton, Fairfield County, Connecticut. The dam and reservoir are adjacent to Route 108 approximately 1 mile south of the intersection with Route 110. The coordinates of the dam are approximately 41°-19.0' north latitude and 73°-6.5' west longitude. The dam is located on Curtiss Brook and is approximately 3,600 feet upstream from its confluence with the Housatonic River.

b. Description of Dam and Appurtenances - The Shelton Reservoir No. 2 Dam is a stone masonry and earth embankment dam approximately 150 feet long and 23 feet high. The dam was built in a steep and narrow valley. A majority of the downstream face is stone masonry varying in slope from vertical to 1:3. The remainder is an earthen face with slopes of approximatley 1:1. The top of the dam is approximatey 15 feet wide.

The spillway is located in the center of the dam and is 32 feet long. At this location, the entire downstream face of the dam is stone masonry. There is a bridge over the spillway that has its underside 3 feet above the spillway crest.

There are upper and lower gate houses for control of a water main. This main has subsequently been abandoned and plugged. There is a 12-inch low level discharge pipe that passes through the base of the dam. Control of the pipe is by means of a gate on the upstream side of the dam. This gate, however, is not operable.

c. Size Classification - The Shelton Reservoir No. 2 Dam has a maximum height of 23 feet and a maximum capacity of 109 acre-feet at the top of the dam. In accordance with the Recommended Guidelines for Safety Inspection of Dams established by the Corps of Engineers, the dam is classified as small

(height less than 40 feet, storage less than 1,000 acre-feet).

d. Hazard Classification - The Shelton Reservoir No. 2 Dam is classifed as having a high hazard potential. Failure of the dam could result in the loss of more than a few lives and cause minor property damage. Approximately 2,500 feet downstream, the flood wave would run into an apartment complex. The first floor sills of these apartments are approximately 6 feet above the streambed. At these apartments, estimated flow and water depth just prior to dam failure is 535 cfs at 2.5 feet and just after dam failure is 5,965 cfs at 7.9 feet.

e. Ownership - The Shelton Reservoir No. 2 Dam is owned by:

Bridgeport Hydraulic Company
835 Main Street
Bridgeport, Connecticut
(203) 367-6621

f. Operator - Operating personnel are under the direction of:

Mr. Edward Stangl
Bridgeport Hydraulic Company
835 Main Street
Bridgeport, Connecticut
(203) 367-6621

g. Purpose of Dam - The dam was constructed to impound Curtiss Brook and form Shelton Reservoir No. 2. The reservoir functioned as a water supply, but is no longer used as such. Presently, the pond is not used for any purpose.

h. Design and Construction History - The Shelton Reservoir No. 2 Dam was constructed around 1900. No information is available on the design or construction of the dam.

i. Normal Operational Procedures - Water level in Shelton Reservoir No. 2 Dam is uncontrolled. The discharge valve is inoperable and the water main is abandoned and plugged.

1.3 Pertinent Data

a. Drainage Area - The Shelton Reservoir No. 2 drainage basin is located in the Town of Shelton, Connecticut and is irregular in shape. The area of the drainage basin is 838 acres (Appendix D -Plate 3). Approximately 5 percent of the drainage basin is natural storage and more than 80 percent is undeveloped. The topography is rolling with elevations ranging from 600 (NGVD) to 272.5 (NGVD) at the spillway crest.

b. Discharge at Damsite - There are no records available for discharge at the dam.

(1)	Outlet works (conduit) size:	12 inches
	Invert elevation (feet above NGVD):	253.5
	Discharge Capacity at top of dam:	28 cfs
(2)	Maximum known flood at damsite:	unknown
(3)	Ungated spillway capacity at top of dam:	535 cfs
	Elevation (NGVD):	276.5
(4)	Ungated spillway capacity at test flood elevation:	550 cfs
	Elevation (NGVD):	278
(5)	Gated spillway capacity at normal pool elevation:	N/A
	Elevation (NGVD):	N/A
(6)	Gated spillway capacity at test flood elevation:	N/A
	Elevation:	N/A
(7)	Total Spillway capacity at test flood elevation:	550 cfs

	Elevation (NGVD):	278
(8)	Total project discharge at top of dam:	563 cfs
	Elevation (NGVD):	276.5
(9)	Total project discharge at test flood elevation:	1,303 cfs
	Elevation (NGVD):	278

c. Elevation (feet above NGVD)

(1)	Streambed at toe of dam:	253.5
(2)	Bottom of cutoff:	unknown
(3)	Maximum tailwater:	261.5
(4)	Normal pool:	272.5
(5)	Full flood control pool:	N/A
(6)	Spillway crest (ungated):	272.5
(7)	Design surcharge (original design):	unknown
(8)	Top of dam:	276.5
(9)	Test flood surcharge:	278

d. Reservoir (length in feet)

(1)	Normal pool:	1,100
(2)	Flood control pool:	N/A
(3)	Spillway crest pool:	1,100
(4)	Top of dam:	1,200
(5)	Test flood pool:	1,250

e. Storage (acre-feet)

(1)	Normal pool:	53.9
(2)	Flood control pool:	N/A
(3)	Spillway crest pool:	53.9

(4)	Top of dam:	109
(5)	Test flood pool:	138
f.	Reservoir Surface (acres)	
(1)	Normal pool:	8.51
(2)	Flood control pool:	N/A
(3)	Spillway crest:	8.51
(4)	Test flood pool:	19.2
(5)	Top of dam:	16.6
g.	Dam	
(1)	Type:	stone masonry earth embankment
(2)	Length:	150 feet
(3)	Height:	23 feet
(4)	Top width:	15 feet
(5)	Side slopes:	1:3 at masonry portion/ 1:1 at earth embankment
(6)	Zoning:	none
(7)	Impervious Core:	unknown
(8)	Cutoff:	unknown
(9)	Grout curtain:	unknown
(10)	Other:	N/A
h.	Diversion and Regulating Tunnel	N/A
i.	Spillway	
(1)	Type:	masonry broad crested
(2)	Length of weir:	32 feet

(3)	Crest elevation (without flashboard):	272.5
(4)	Gates:	N/A
(5)	U/S channel:	none
(6)	D/S channel:	stone and concrete apron-natural channel
(7)	General:	N/A

j. Regulating Outlets

(1)	Invert elevation (NGVD):	253.5
(2)	Size:	12 inches
(3)	Description:	cast iron pipe
(4)	Control Mechanism	manually operated gate
(5)	Other:	gate not operable

SECTION 2 - ENGINEERING DATA

2.1 Design Data

No design computations or drawings are available for this dam.

2.2 Construction Data

The dam was constructed around 1900. No construction drawings or data are available for this dam.

2.3 Operation Data

The reservoir was used as a water supply but is not used any more. The water main has been abandoned and plugged. The discharge pipe is not operable. No operating records for this dam have been maintained.

2.4 Evaluation of Data

a. Availability - No design, construction or operation data is available for this dam.

b. Adequacy - No information is available.

c. Validity - No information is available.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General - The visual inspection was conducted on May 30, 1980 by members of the engineering staff of Storch Engineers, D. Baugh and Associates and Matthews Associates. A copy of the visual inspection checklist is contained in Appendix A of this report. Selected photos of the dam are contained in Appendix C.

In general, the overall condition of the dam and its appurtenant structures is fair.

b. Dam - The dam is a stone masonry and earth embankment structure. A majority of the downstream face is stone masonry as shown in the overview photo. The earth embankments are heavily overgrown with trees and brush (Photos 1, 2, 3 and 4). There are several areas of seepage through the face of the dam (Photos 4, 6 and 7). The amount of water, however, was not measurable. The masonry of the downstream face of the dam just below the spillway was in poor condition with the joints in need of repair. Water was seeping out in some locations (Photos 3 and 4).

The upstream face of the dam has a stone masonry retaining wall that is in poor condition (Photos 1 and 2). The wall is cracked in many places and in some locations, it is overturning and falling into the water (Photo 1).

The crest of the dam had a roadway on it that showed no signs of settlement although there were many signs of trespassing.

c. Appurtenant Structures - The spillway is 32 feet long and 15 feet wide (Photo 1). There is a bridge with a center pier over the spillway with 3 feet of clearance from the underside of the bridge to the spillway crest. This bridge is in poor condition. Cap stones are placed along the crest at the downstream end of the spillway (Photo 4). At the time of the inspection, water was flowing under these cap stones and exiting through the joints below.

The channel approaching the spillway and the area under the bridge was cluttered with debris. The banks of the downstream channel were heavily overgrown. The channel was in a natural condition except for the debris thrown in from a local construction project.

Both spillway training walls, like the rest of the stone masonry, were in need of repair. The north wall showed signs of seepage with some staining (Photo 6). The amount of water seeping, however, was negligible.

There is a 12-inch low level discharge pipe that passes through the base of the dam (Photo 5). The gate to the pipe is on the upstream face with access to the mechanism through a hole in the bridge over the spillway. The gate is inoperable.

Both the upper and lower gate houses are in poor condition (Photos 8 and 9). The deck of the service bridge to the upper gate house is missing and the support beams are rusting away. The lower gate house is in better condition, however, trespassing is a problem. The water main that was controlled by the gates in the gate houses is not operable and is plugged.

d. Reservoir Area - The area immediately adjacent to the pond is gently sloped and in a natural state. The shoreline shows no signs of sloughing or erosion. A rapid rise in the water level of the pond will not endanger life or property.

e. Downstream Channel - The downstream channel is natural and comprised of rock and gravel. The area adjacent to the downstream channel is heavily overgrown with brush and trees.

3.2 Evaluation

Overall the general condition of the dam is fair. The visual inspection revealed items that lead to this assessment, such as:

a. Seepage through the dam and training walls

b. Missing mortar and poor condition of the joints

c. Inoperation of the lower discharge pipe

d. Cracking and movement of the upstream retaining wall

e. Vegetation on the downstream face, earth embankments, along the toe of the dam and downstream channel

f. Trespassing on the dam and vandalism.

SECTION 4 - OPERATIONAL AND MAINTENANCE PROCEDURES

4.1 Operational Procedures

a. General - The operation of this facility was strictly for water supply but this purpose was abandoned sometime ago. The water level is kept at the spillway crest only because the discharge valve is not operable.

b. Description of Any Warning System in Effect - There is no formal warning system in effect for this dam.

4.2 Maintenance Procedures

a. General - There is no specific maintenance program for this dam, however, maintenance personnel visit the site on a regular basis and there is periodic clearing of the vegetation on the downstream side.

b. Operating Facilities - The gate and the discharge pipe are not operable.

4.3 Evaluation

There is no regularly scheduled maintenance program, however, there is periodic vegetation removal. A systematic and complete maintenance program should be instituted at the dam and a formal warning system should be developed.

SECTION 5 - EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General

The Shelton Reservoir No. 2 Dam is a stone masonry and earth embankment dam approximately 150 feet long and 23 feet high. The majority of the downstream face is stone masonry. There is a 32-foot long, 3-foot deep and 15-foot wide spillway at the center of the dam. A 12-inch low level discharge pipe passes through the base of the dam with the gate valve on the upstream face of the dam. This valve is inoperable.

The watershed encompasses 838 acres and is 80 percent undeveloped. The topography is rolling with terrain rising 322 feet from the spillway crest.

The pond has a total capacity of 109 acre-feet when the pond is at the top of the earth embankment and 53.9 acre-feet at the spillway crest. Therefore, there is approximately 55.1 acre-feet (0.8 inches per acre) of storage available. The test flood outflow for this dam is 1,280 cfs and the spillway capacity is 535 cfs or approximately 42 percent of the test flood outflow.

5.2 Design Data

No design data for the original dam is available. Hydraulic computations by Genovese & Associates for Bridgeport Hydraulics (Inspection Report) are found in Appendix B of this report. Independent computations for this dam were also developed and used for this report.

5.3 Experience Data

No historical data for recorded discharges or water surface elevation is available for this dam, however, the dam has withstood the floods of the 1930's and 1950's, as well as more recent storms such as January, 1979.

5.4 Test Flood Analysis

Based on the Recommended Guidelines for Safety Inspection of Dams, the dam is classified as a small structure with a high hazard potential. The test flood for these conditions ranges from 1/2 the probable maximum flood (PMF) to the PMF. One half of the PMF was used for this dam because of its small size.

Using guide curves established by the Corps of Engineers (rolling terrain) the test flood inflow is 1,475 cfs. The routing procedure established by the Corps' guidelines gives an approximate outflow of 1,280 cfs. The spillway capacity of the dam is approximately 535 cfs or 42 percent of the routed test flood outflow. The test flood will overflow the spillway by 1.5 feet.

Storage behind the dam was assumed to begin at the elevation of the spillway crest. Storage was determined by an average area depth analysis. Capacity curves for the spillway assumed a broad crested weir.

5.5 Dam Failure Analysis

A dam failure analysis was performed using the Rule of Thumb method in accordance with guidelines established by the Corps of Engineers. Failure was assumed to occur when the water level in the pond was at the top of the dam.

The spillway discharge just prior to dam failure is 535 cfs and will produce a depth of flow of approximately 2.5 feet several hundred feet downstream from the dam. The calculated dam failure discharge is 7,420 cfs and will produce a depth of flow of approximately 8.0 feet several hundred feet downstream from the dam or an increase in water depth at failure of approximately 5.5 feet. The failure analysis covered a distance of approximately 2,500 feet downstream where the depth of flow was calculated to be 7.9 feet or an increase in depth of approximately 5.4 feet.

Failure of Shelton Reservoir No. 2 Dam could result in the loss of more than a few lives and the flood wave may damage four buildings including an apartment building. The apartment building is located approximately 2,500 feet downstream and its first floor elevation is approximately 6 feet above the streambed.

SECTION 6 - EVALUATION OF STRUCTURAL STABILITY

6.1 Visual Observations

The general structural stability of the dam is fair as evidenced by its vertical, horizontal and lateral alignment. The stone masonry shows no movement but is in need of repair. The earth embankment portions of the dam also show no evidence of instability. The structural stability of the dam, however, can be affected by the items noted in Section 3.2.

6.2 Design and Construction Data

The dam was constructed around 1900. No plans or construction information are available for this dam.

6.3 Post-Construction Changes

The only post-construction change was the abandonment of the water main.

6.4 Seismic Stability

The dam is located in Seismic Zone 1 and in accordance with Recommended Phase I Guidelines does not warrant a seismic analysis.

SECTION 7 - ASSESSMENT, RECOMMENDATIONS AND REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition - After consideration of the available information, the results of the inspection, contact with the owner and hydraulic/hydrologic computations, the general condition of the Shelton Reservoir No. 2 Dam is fair.

b. Adequacy of Information - The information available is such that an assessment of the safety of the dam should be based on the available data, the visual inspection results, past operational performance of the dam and its appurtenant structures and computations developed for this report.

c. Urgency - It is considered that the recommendations and remedial measures suggested below be implemented within one year after receipt of this Phase I Inspection Report.

7.2 Recommendations

The following recommendations should be carried out under the direction of a qualified registered engineer.

a. Seepage through the dam and the spillway training walls should be investigated further to determine its origin and monitored to determine any changes.

b. Cracking and movement of the upstream retaining wall should be investigated and means of repair established.

c. Trees, including stumps and root systems, should be removed from the toe and embankment slopes and backfilled with proper material.

d. The condition of the low level discharge pipe and valve should be evaluated and both pipe and valve be made operable.

e. The bridge to the upper gate house should be repaired.

f. Prepare a detailed hydraulic/hydrologic study to determine spillway adequacy and an increase of the total project discharge if necessary.

Any other recommendations made by the Engineer should be implemented by the Owner.

7.3 Remedial Measures

a. Operation and Maintenance Procedures -

(1) Remove all brush from the earth embankment, downstream face of the dam and within 20 feet of the toe of the dam.

(2) Clear the downstream channel and the spillway of debris.

(3) Repair the bridge over the spillway.

(4) Repair all joints and cracked and spalled concrete.

(5) Institute a program of annual technical inspection by a qualified Engineer.

(6) Develop plans for around-the-clock surveillance for periods of unusually heavy rains and institute a formal downstream warning system for use in the event of an emergency.

7.4 Alternatives

There are no practical alternatives to the above recommendations.

APPENDIX A

INSPECTION CHECKLIST

INSPECTION CHECK LIST

PARTY ORGANIZATION

PROJECT Shelton Reservoir No. 2 Dam

DATE 6-10-80

TIME 9:30 a.m.

WEATHER Partly Cloudy

W.S. ELEV. _____ U.S. _____ DN.S.

PARTY:

1. J. Schearer, SE, Civil
2. K. Pudeler, SE, Civil
3. G. Giroux, SE, Hyd/Civil
4. S. Jordan, SE, Geo.
5. M. Haire, DBA, Struc./Geo.
6. P. Austin, DBA, Civil
7. J. Pozzato, MA, Mech.
8. _____
9. _____
10. _____

	PROJECT FEATURE	INSPECTED BY	REMARKS
1.	Dam Embankment	S. Jordan G. Giroux	Fair
2.	Outlet works - Control Tower	M. Haire P. Austin	Poor
3.	Mechanical - Electrical	J. Pozzato	Poor
4.	Spillway weir - Discharge Channel	K. Pudeler G. Giroux	Fair
5.	Outlet Works - Service Bridge	M. Haire	Poor
6.			
7.			
8.			
9.			
10.			

INSPECTION CHECK LIST

PROJECT Shelton Reservoir No. 2 Dam DATE 6-10-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITIONS
DAM EMBANKMENT	
Crest Elevation	Poor
Current Pool Elevation	Poor
Maximum Impoundment to Date	Fair
Surface Cracks	Some - embankment walls cracked
Pavement Condition	N/A
Movement or Settlement of Crest	Good
Lateral Movement	Poor - upstream walls being pushed into the pond.
Vertical Alignment	Good
Horizontal Alignment	Poor - see lateral movement
Condition at Abutment and at Concrete Structures	Poor - Loose & missing mortar in stone
Indications of Movement of Structural Items on Slopes	N/A
Trespassing on Slopes	Problem
Vegitation on Slopes	Heavy
Sloughing or Erosion of Slopes or Abutments	None
Rock Slope Protection - Riprap Failures	Fair - no failures
Unusual Movement or Cracking at or near Toes	None
Unusual Embankment or Downstream Seepage	Seepage through some joints
Piping or Boils	None
Foundation Drainage Features	None
Toe Drains	None
Instrumentation System	None

INSPECTION CHECK LIST

PROJECT Shelton Reservoir No. 2 Dam DATE 6-10-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE	
a. Approach Channel	Underwater
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	Poor condition - could not inspect
Stop Logs and Slots	

INSPECTION CHECK LIST

PROJECT Shelton Reservoir No. 2 Dam DATE 6-10-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - CONTROL TOWER	Poor Condition - could not inspect
a. Concrete and Structural	
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staining of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lightning Protection System	
Emergency Power System	
Wiring and Lighting System in Gate Chamber	

INSPECTION CHECK LIST

PROJECT Shelton Reservoir No. 2 Dam · DATE 6-10-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - TRANSITION AND CONDUIT	N/A
General Condition of Concrete	
Rust or Staining on Concrete	
Spalling	
Erosion or Cavitation	
Cracking	
Alignment of Monoliths	
Alignment of Joints	
Numbering of Monoliths	

INSPECTION CHECK LIST

PROJECT Shelton, Reservoir No. 2 Dam DATE 6-10-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	N/A
General Condition of Concrete	
Rust or Staining	
Spalling	
Erosion or Cavitation	
Visible Reinforcing	
Any Seepage or Efflorescence	
Condition at Joints	
Drain holes	
Channel	
Loose Rock or Trees Overhanging Channel	
Condition of Discharge Channel	

INSPECTION CHECK LIST

PROJECT Shelton Reservoir No. 2 Dam DATE 6-10-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	
General Condition	Unknown - underwater
Loose Rock Overhanging Channel	No
Trees Overhanging Channel	No
Floor of Approach Channel	Unknown
b. Weir and Training Walls	
General Condition of Mortared Stone	Poor - many failed joints in weir and training walls
Rust or Staining	None
Spalling	None
Any Visible Reinforcing	N/A
Any Seepage or Efflorescence	Yes - extensive through weir through joints of stone
Drain Holes	None
c. Discharge Channel	
General Condition	Poor
Loose Rock Overhanging Channel	Yes
Trees Overhanging Channel	Yes
Floor of Channel	Rock
Other Obstructions	Debris in channel

INSPECTION CHECK LIST

PROJECT Shelton Reservoir No. 2 Dam DATE 6-10-80

PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITION
OUTLET WORKS - SERVICE BRIDGE	
a. Super Structure	
Bearings	Failed
Anchor Bolts	N/A
Bridge Seat	Failed
Longitudinal Members	Open web joints - rusted - one has failed
Under Side of Deck	Deck is missing
Secondary Bracing	None
Deck	Deck is missing
Drainage System	N/A
Railings	None
Expansion Joints	None
Paint	None
b. Abutment & Piers	
General Condition of Concrete	Poor - cracked and broken
Alignment of Abutment	Poor - falling towards water
Approach to Bridge	N/A
Condition of Seat & Backwall	Failed

APPENDIX B

ENGINEERING DATA

Information pertaining to the history, maintenance and modification to Shelton Reservoir No. 2 Dam as well as copies of past reports are located at:

Bridgeport Hydraluic Company
835 Main Street
Bridgeport, Connecticut

SHELTON NO. 2 DAM (Impounded but out of Service)

General

The area appears to receive very little attention from the company. The roadway and bridge across the dam are being used extensively by children, possibly on their way to and from school. The fencing on both sides of the bridge has some play but appears sturdy enough to prevent the children from falling off. Stones placed across the roadway prevent cars from driving onto the dam. However, a wooden barricade intended to keep motorcycles off was laying in the water downstream of the dam. The area is not well posted or fenced and gives the appearance of a public area.

Inspection was made November 17, 1977 with the pond approximately 1-inch above the spillway.

Upper Gate House

No serious problems with the upper gate house were observed although a close look was not possible.

It was inaccessible because the deck of the footbridge to it had been removed as recommended in last years inspection report. The steel trusses for the footbridge remain. The north truss appears alright but the south one has nearly disintegrated at the end nearest the dam. It should be removed as the deck was rather than let it remain as an attractive nuisance.

Lower Gate House

The stairway down to the lower gate house is gone. The door of the lower gate house remains open. There is junk and debris in gate house and it appears that children have been using it to play in.

Dam

The masonary on the upstream side is deteriorating. In particular there is separation between some blocks of masonry south of the spillway.

Trees and brush are growing on the downstream face of the dam. The portion north of the spillway is worse than that south of the spillway. All of this except the large trees should be cleared. The roots from these can penetrate and weaken the dam. If roots of significant size penetrate on earthen embankment and the tree then dies, the roots will decay causing settlement and leaving passage where seepage through the dam can become channelized. Trees and brush also

make inspection of the downstream face of the dam difficult and could conceal problems.

DAM INSPECTION — Bridgeport Hydraulic Company Dams

Name of Dam: Shelton Reservoir #2

I. PROJECT INFORMATION:

A. AUTHORITY:

This inspection was authorized by a letter from Bridgeport Hydraulic Company dated October, 13, 1978 to Philip W. Genovese & Associates, Inc. Said letter was signed by Edward Stangl, whose title is Manager - Project Engineering. The letter was also signed by Robert Reinert, Vice President of Engineering and Planning.

B. PURPOSE:

The purpose of the study is to perform inspection and evaluation of various Bridgeport Hydraulic Dams in terms of their safety.

C. DESCRIPTION:

Shelton Reservoir #2 and the reservoir dam are located in the City of Shelton, Connecticut. The reservoir impounds Curtiss Brook which flows approximately 3,500 ft. from the dam to its confluence with the Housatonic River. The Shelton Reservoir Dam #2 is a cement rubble masonry dam with no spillway structure other than the top of the dam. A foot bridge over the spillway section is in poor condition.

Dam: Shelton Reservoir #2

D. PERTINENT DATA:

1.	Drainage Area:	1.31 square miles	838 acres
2.	Discharge at Dam:	Does not apply.	
3.	Elevation:	274 ft (company map dated 12/11/58)	
4.	Reservoir:	Length of maximum pool = 1,100 ft ±	
5.	Storage:	Does not apply.	
6.	Reservoir Surface:	Does not apply.	
7.	Dam:		
	Type:	Cement rubble masonry	
	Length:	100 ft ±	
	Height:	23 ft ±	
	Top Width:	15 ft ±	
	Side Slopes: Up Stream		Variable and steep.
	Down Stream		Variable and steep.
8.	Diversion and Regulating Controls:	Does not apply.	
9.	Spillway:	See Attached Sketch	
	Type:	Cement rubble masonry.	
	Length of Weir:	See Attached Sketch	
	Gates:	None	
	Up Stream Channel:	See Attached Sketch	
	Down Stream Channel:	See Attached Sketch	

Dam: Shelton Reservoir #2

II. ENGINEERING DATA (Existing):

Contour Map of Shelton Reservoir #2 - Shelton, Connecticut 12/11/58 (Bridgeport Hydraulics). This map includes a limited plan view of the dam.

III. VISUAL INSPECTION:

A. FINDINGS:

This is a small masonry dam. Timber beams support a bridge across the spillway section. The cement rubble masonry is deteriorating in many places as is the bridge across the spillway. There are trees and fairly thick brush growing in the spillway. The road and fence appear to be in good condition.

B. EVALUATION:

The dam appears to be in good condition.

IV. OPERATIONAL PROCEDURES:

Does not apply

V. HYDROLOGY AND HYDRAULIC ANALYSES:

The results of the analysis of the hydrology and hydraulics of the dam indicate the spillway will pass a flow of 474 cfs (100 year frequency) with a head of 2.8 ft above the spillway crest. The bottom of the timber bridge would be reached at a flow of 535 cfs which corresponds to a frequency of approximately 130 years. The hydraulic control for this structure is:

Control	Flow (cfs)	Frequency (years)
Bottom of Bridge	535	130

VI. STRUCTURAL STABILITY:

A. VISUAL OBSERVATION:

1. Embankment: Visual examination indicates no serious structural problems.

2. Appurtenant Structures: Does Not Apply

Dam:

B. DESIGN AND CONSTRUCTION DATA:

Does not apply

C. OPERATING RECORDS:

Does not apply

D. POST CONSTRUCTION CHANGES:

Does not apply

E. SEISMIC STABILITY:

The dam is located in seismic zone #1.

VII. DAM ASSESSMENT:

Visual inspection of the dam indicates generally good condition. This condition designation means the facility requires action within 2 to 3 years by the owner for the specific areas described.

Two items that require action are:

1. Repair of deteriorated joints of the cement rubble masonry dam and spillway;
2. Removal of vegetation in the form of trees and brush from the downstream face of the dam.

Either or both of these conditions could ultimately lead to destruction of the dam.

Another condition which requires further investigation is the extent of siltation behind the dam. If the original design of the dam had a factor of safety of at least 1.3 for all loads (water, ice pressure, wave pressure and uplift pressure) excluding siltation, then the dam would be safe even if

siltation reaches the top of the dam. However, this condition would reduce the factor of safety to 1.0. Further investigation should be made to determine

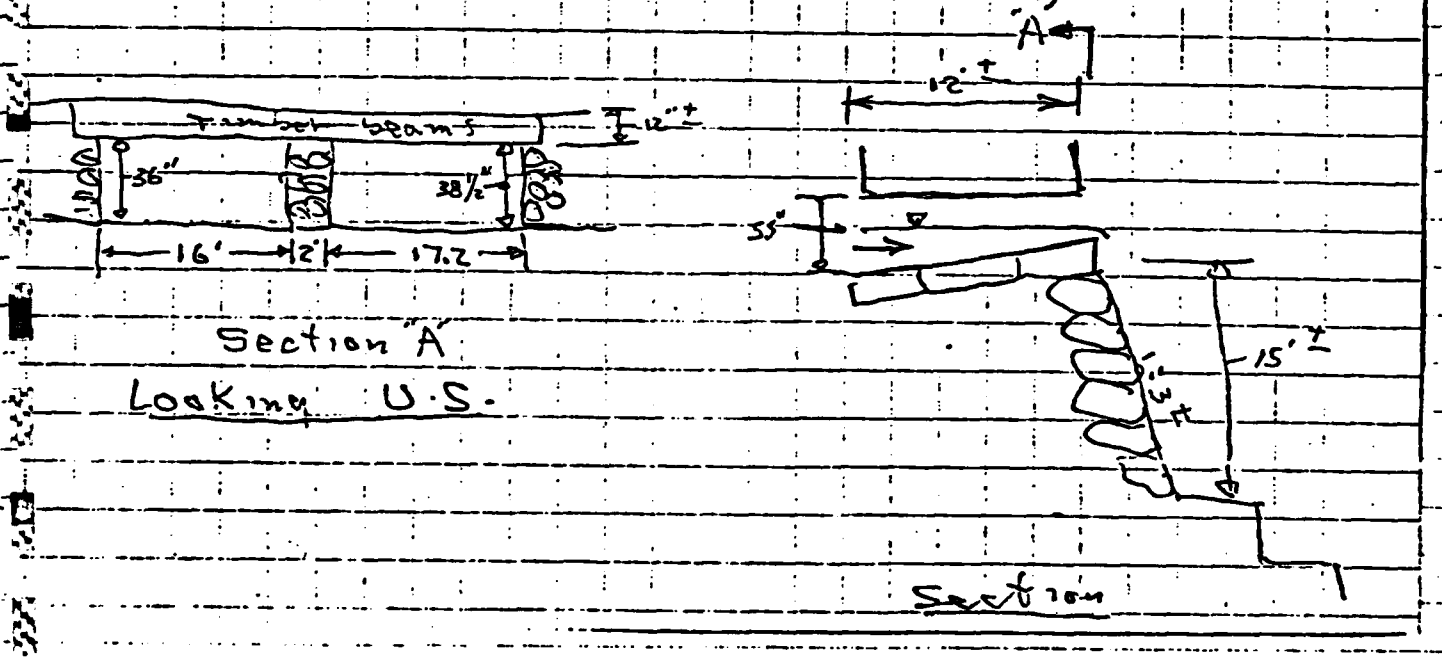
1. Extent of siltation behind the dam;
2. Actual section of the cement rubble masonry dam (for stability analysis).

Prepared by: Robert L. Jones, P.C.

Project Engineer

11/7/78

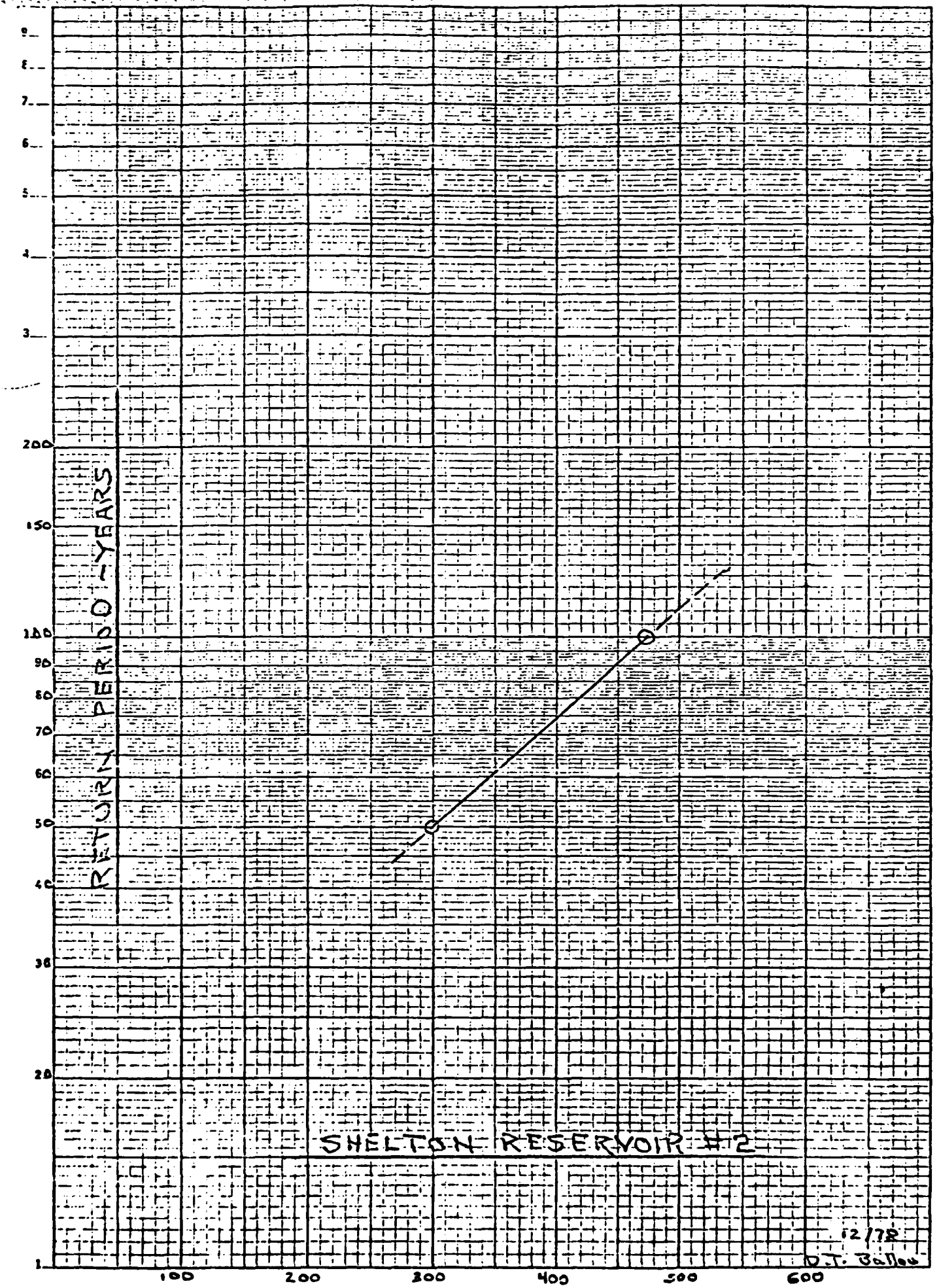
Shelton Reservoir #2 (Curtiss Brook)

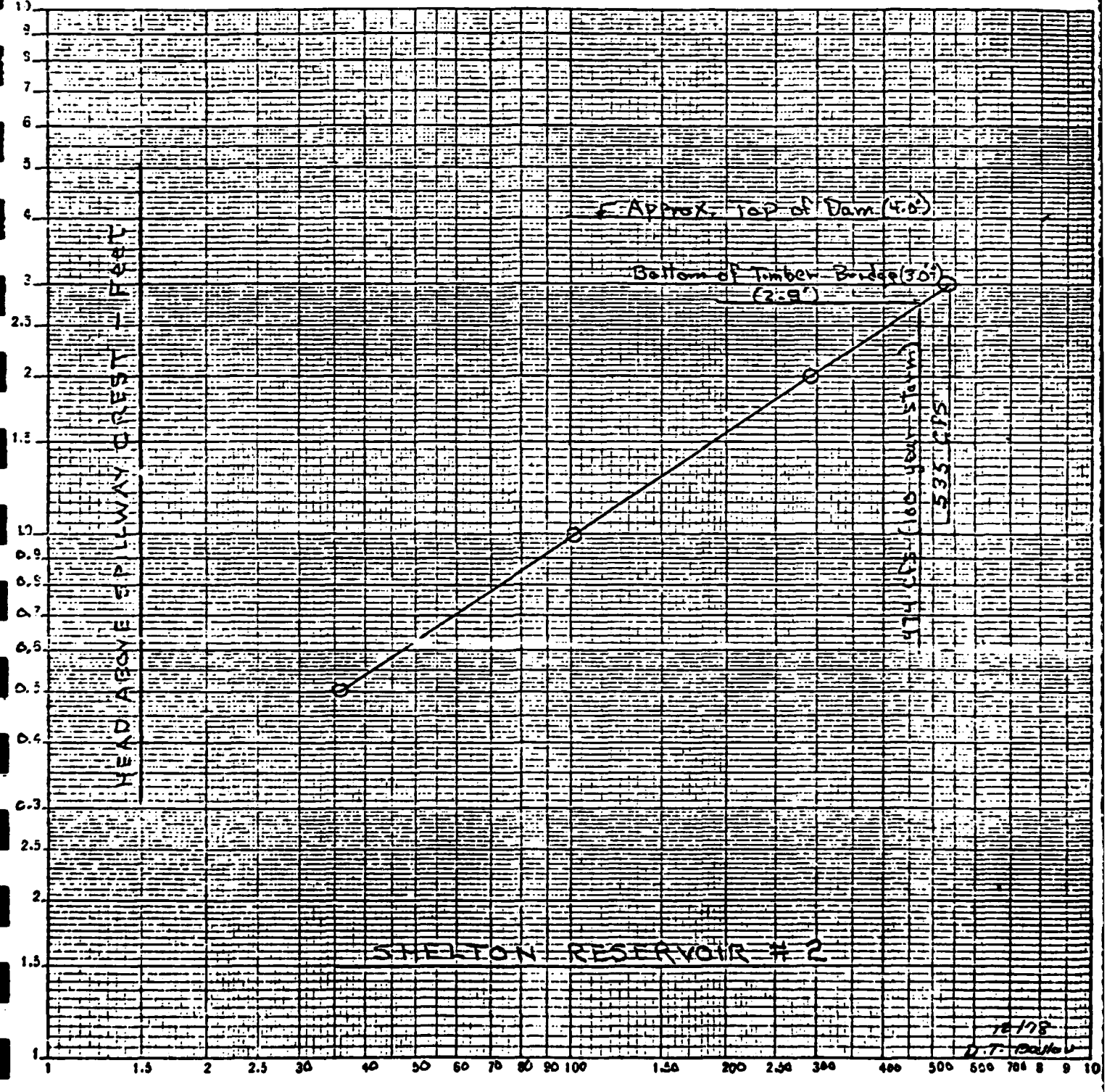


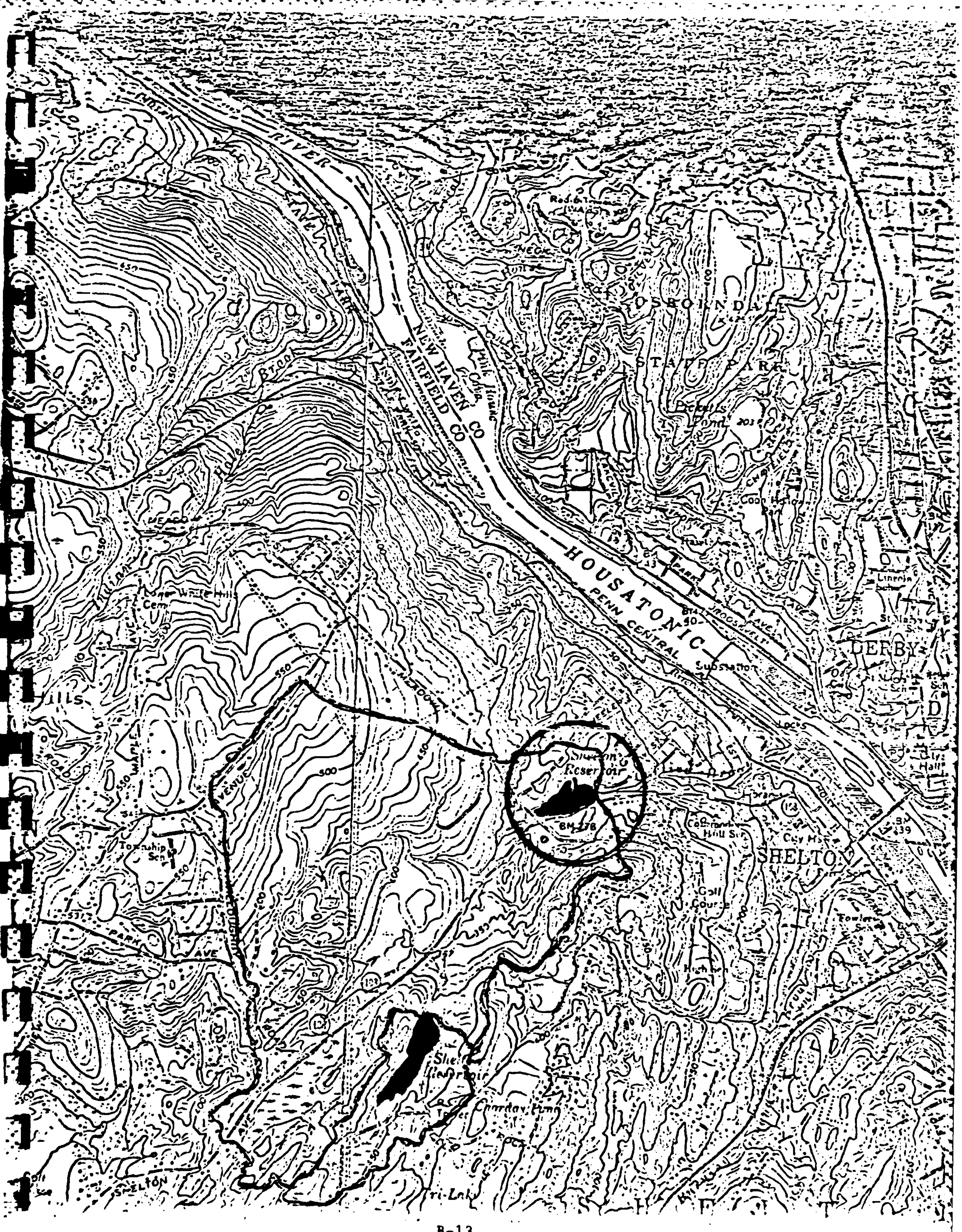
Section "A"

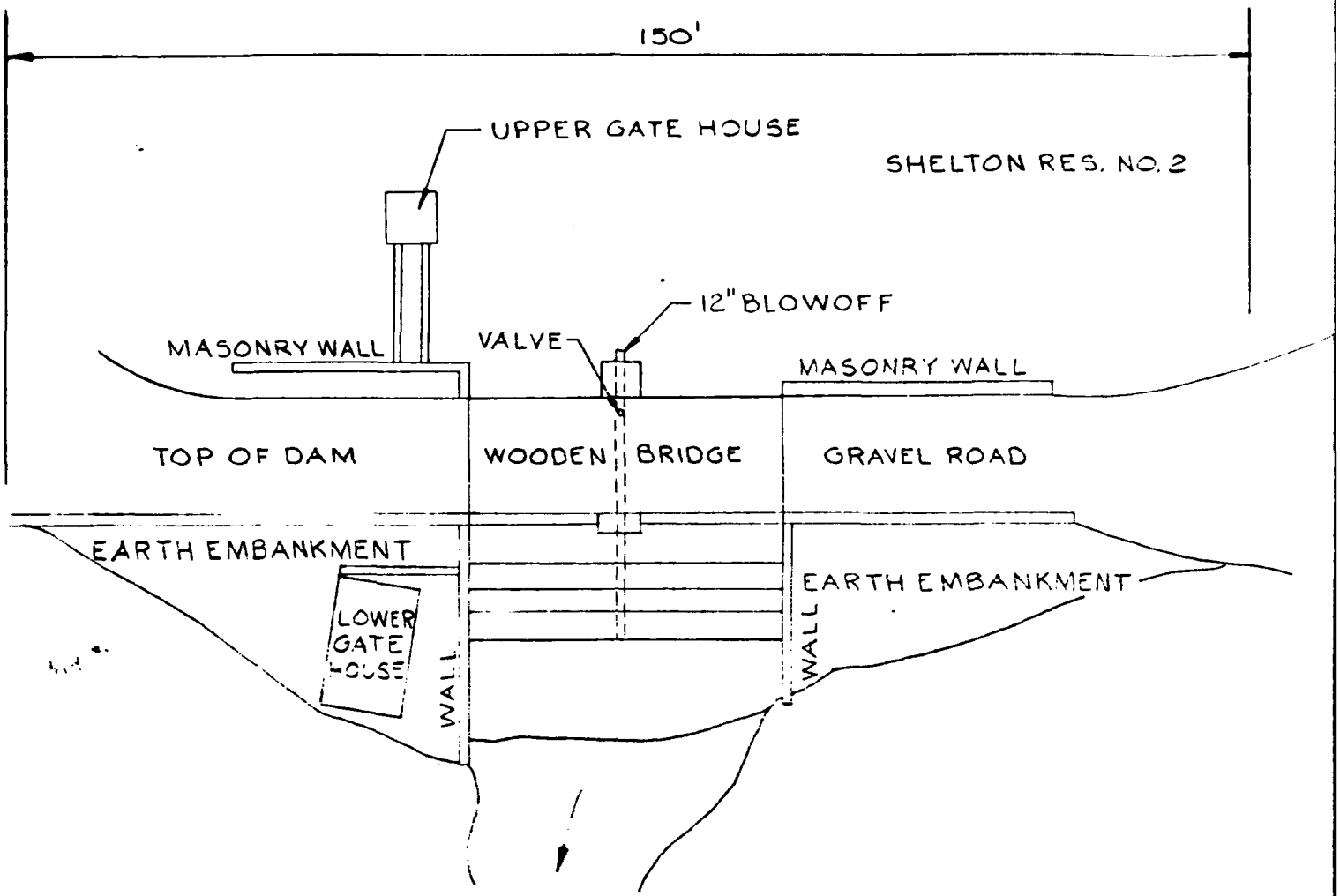
Looking U.S.

Section

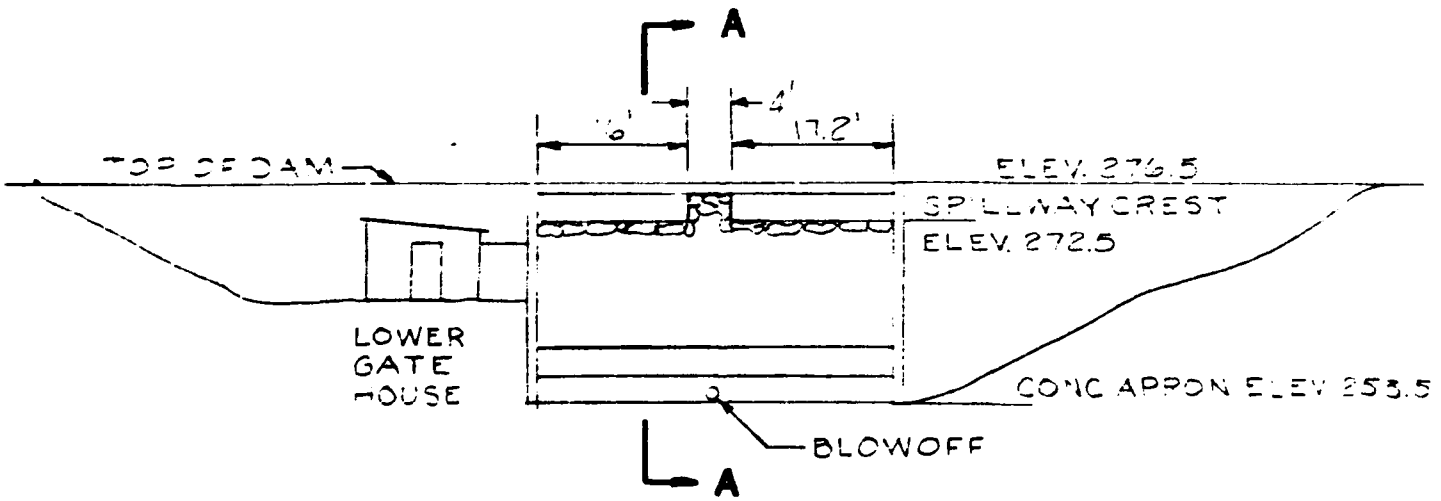

RETURN PERIOD - YEARS
9
8
7
6
5
4
3
200
150
100
90
80
70
60
50
40
30
20
1
100
200
300
400
500
600
SHELTON RESERVOIR #2
12/78
D.J. Ballou


HEAD ABOVE SPILLWAY CREST - Feet
← Approx. Top of Dam (4.0')
Bottom of Timber Bridge (3.0')
(2.9')
535 cfs
494 cfs (100 year flood)
SHELTON RESERVOIR # 2
1 1.5 2 2.5 3 4 5 6 7 8 9 10 15 20 25 30 40 50 60 70 80 90 100 150 200 250 300 400 500 600 700 800 900 1000
SPILLWAY DISCHARGE - CFS

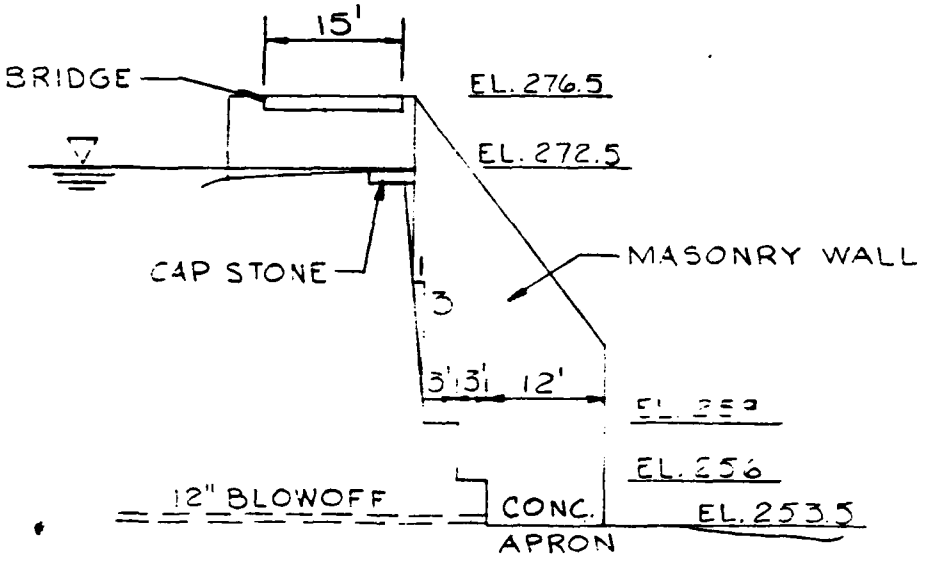

HOUSATONIC
NEW HAVEN CO
FAIRFIELD CO
PENN CENTRAL
RIVER
ROOSEVELT
DERBY
SHELTON
Substation
Golf Course
Township Sch
PARK AVE
BM 278



PLAN



ELEVATION



SECTION A-A

PLATE 1

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

SHELTON RES. NO. 2 DAM

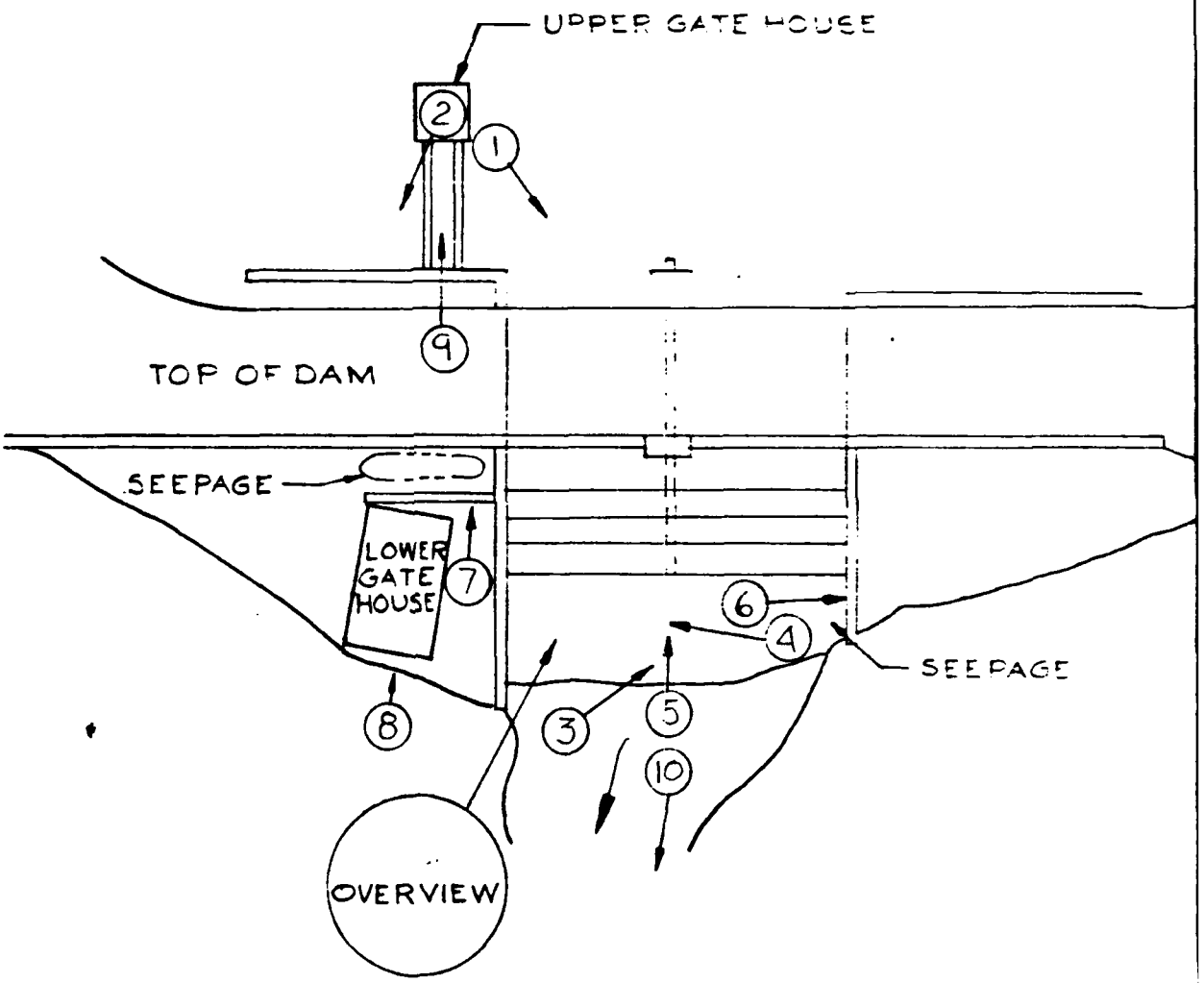
NOT TO SCALE

SCALE: AS SHOWN

DATE: SEPTEMBER 1978

APPENDIX C

PHOTOGRAPHS


UPPER GATE HOUSE
2
1
9
TOP OF DAM
SEEPAGE
LOWER GATE HOUSE
7
6
4
SEEPAGE
8
3
5
10
OVERVIEW

NOT TO SCAL

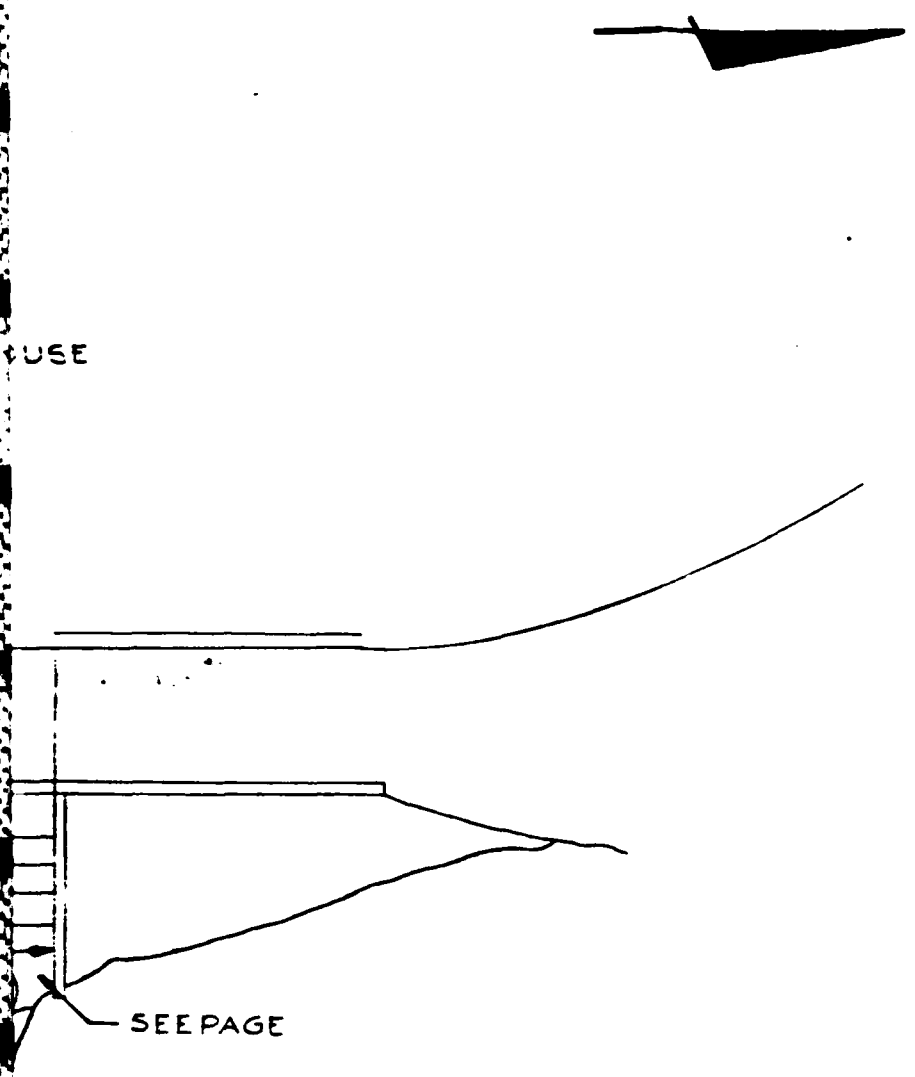


PHOTO LOCATION PLAN

PLATE 2

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

SHELTON RES. NO. 2 DAM

NOT TO SCALE

SCALE: AS SHOWN

DATE: SEPTEMBER 1980

PHOTO 1

UPSTREAM FACE OF DAM

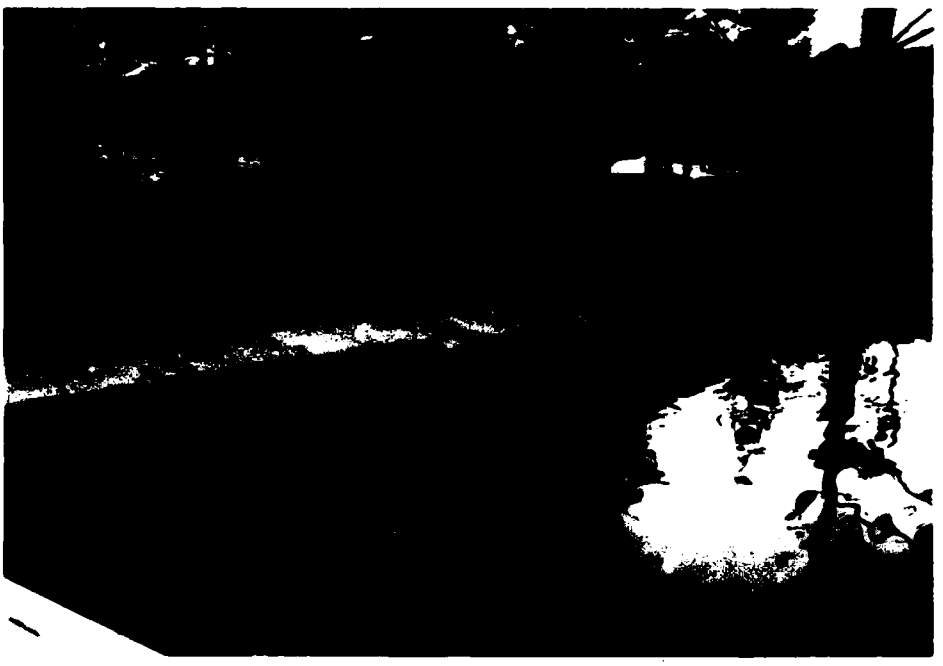


PHOTO 2

UPSTREAM FACE OF DAM

PHOTO 3

DOWNSTREAM FACE AND WEST ABUTMENT

PHOTO 4

DOWNSTREAM FACE AND EAST ABUTMENT

PHOTO 5

BLOWOFF

PHOTO 6

SEEPAGE - WEST ABUTMENT

PHOTO 7

SEEPAGE - DOWNSTREAM FACE

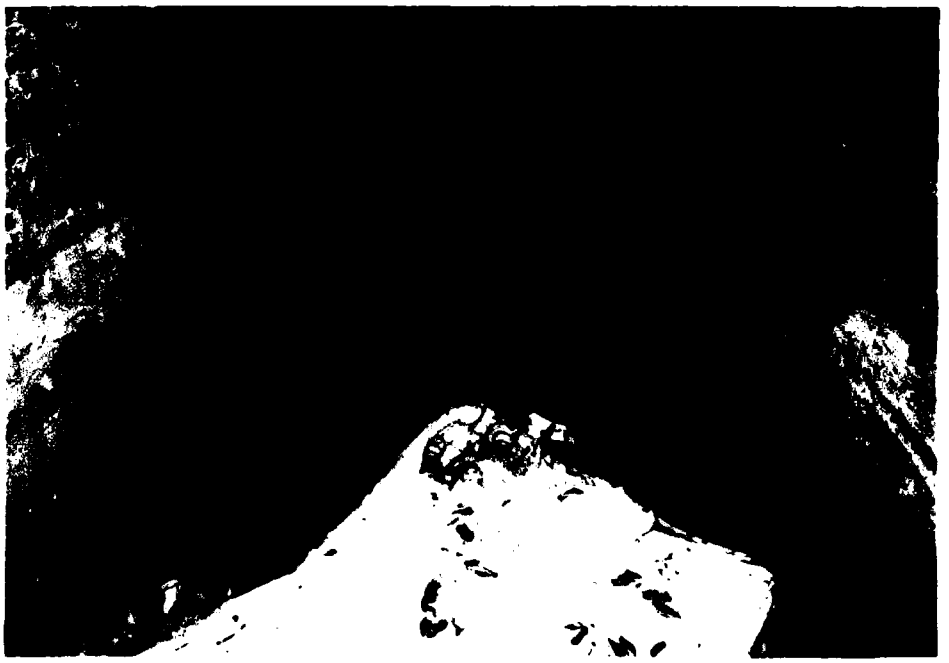


PHOTO 8

INSIDE LOWER GATE HOUSE

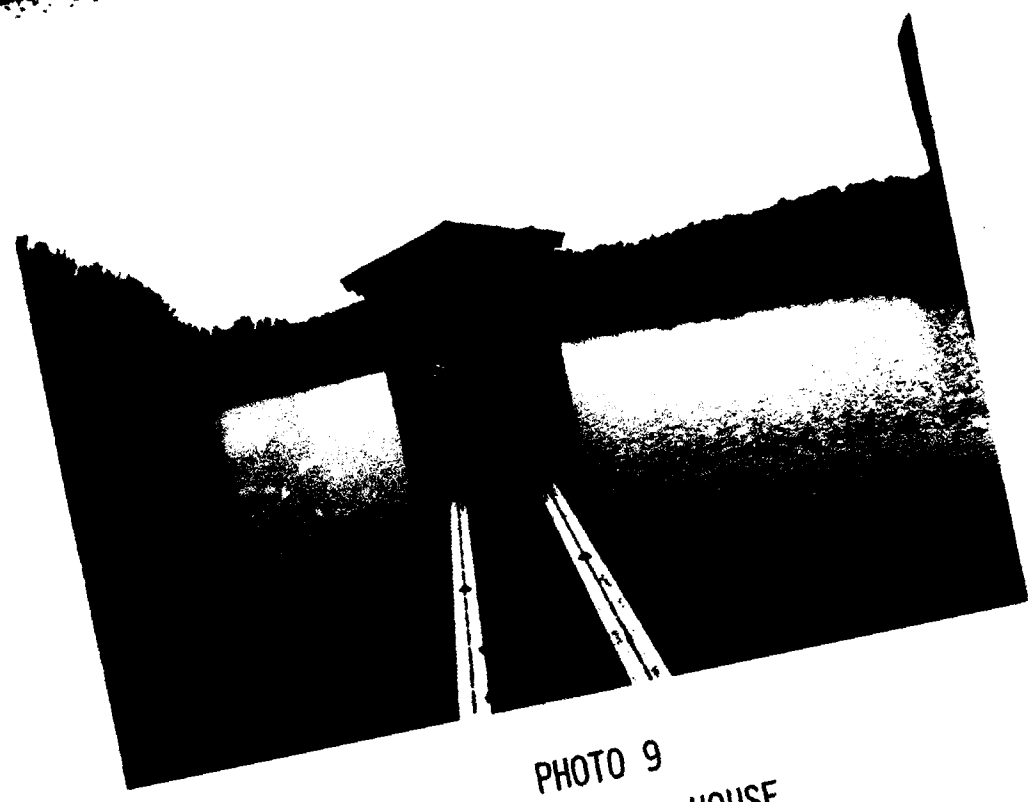


PHOTO 9
UPSTREAM GATE HOUSE

PHOTO 10
DOWNSTREAM CHANNEL LOOKING DOWNSTREAM

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

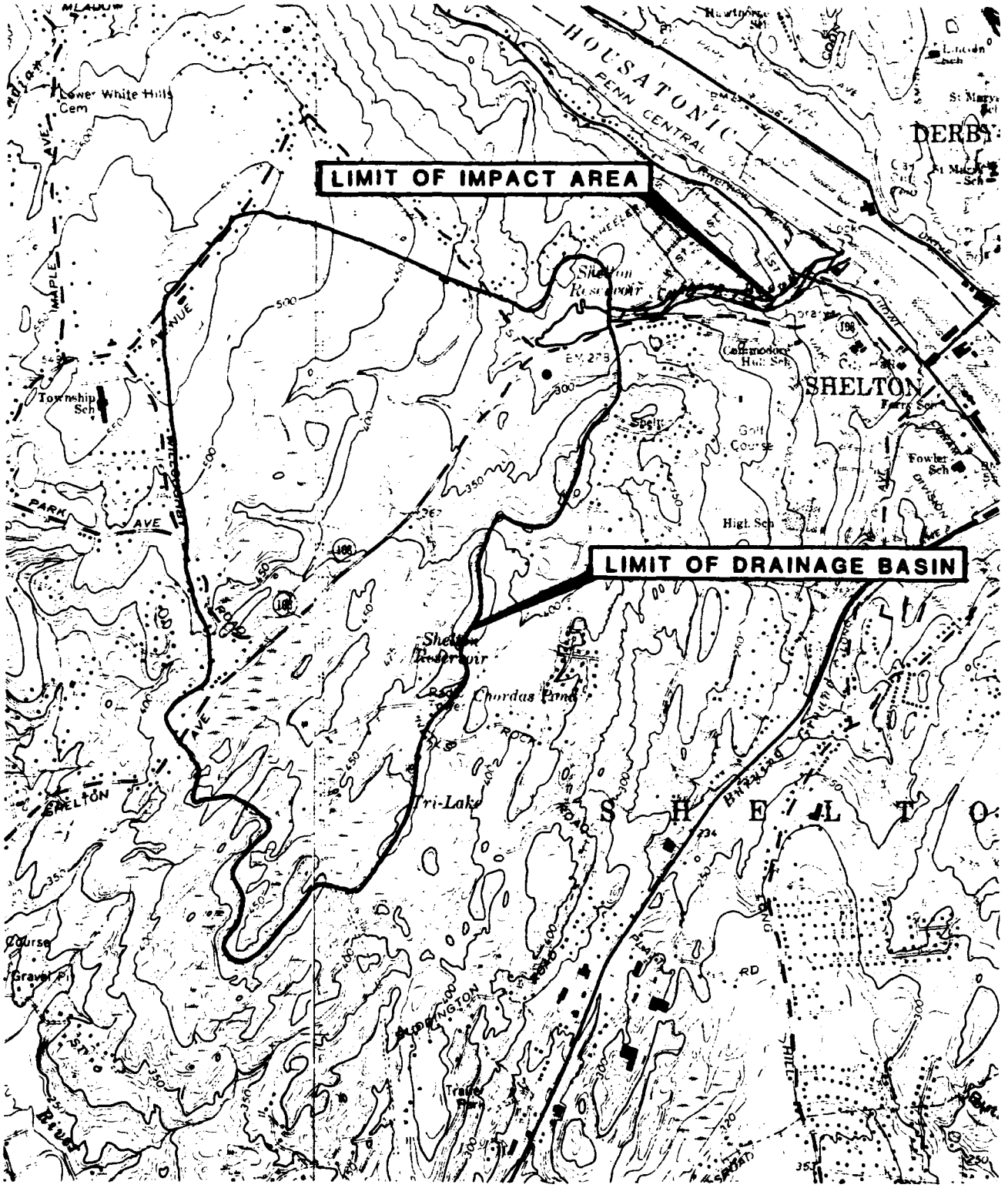


PLATE 3

STORCH ENGINEERS WETHERSFIELD, CONNECTICUT	U.S. ARMY ENGINEER DIV NEW ENGLAND CORPS OF ENGINEERS WALTHAM MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

SHELTON RES. NO. 2 DAM

scale 1:24000

SCALE AS SHOWN

DATE SEPTEMBER 1980

STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

JOB Phase I Dam Inspection - #4463
SHEET NO. _____ OF _____
CALCULATED BY GNG DATE 6/27/80
CHECKED BY RDC DATE 8/20/80

Determination of PMF

NAME OF DAM Shelton Reservoir No 2 Dam

DRAINAGE AREA 1.81 SM

INFLOW Size - Small Hazard - High ½ to PMF
use ½ PMF

½ PMF = 1125 cfs/SM

Q = 1125 (1.81) = 1473 cfs

Estimating the effect of surcharge storage on the Maximum Probable Discharges

1. Q_{P1} = 1475 cfs
2a. H_1 = 278.5 (elev.)
b. $STOR_1$ = 1.3"
c. $Q_{P2} = Q_{P1} (1 - STOR_1/9.5)$ = 1275 cfs
3a. H_2 = 278 $STOR_2$ = 1.17"
b. $STOR_A$ = 1.24"

Q_{PA} = 1475 (1 - 1.24/9.6) = 1260 cfs
H_A = 278 $STOR_A$ = 1.17"

½ PMF = 1280 cfs

Capacity of the spillway when the pond elevation is at the top of the dam

Q = 535 cfs or 42 % of the ½ PMF

STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

JOB Phase I Dam Inspection 4463
SHEET NO _____ OF _____
CALCULATED BY G.C.G DATE 6/30/80
CHECKED BY EDC DATE 7/22/80
SCALE Stage Discharge

NAME OF DAM Shelton Res. No.2 Dam

$Q = CLH^{3/2}$

	Spillway I				Spillway II				Dam				
Elev	C	L	H	Q	C	L	H	Q	C	L	H	Q	QT

See Inspection Report by: Genovese & Associates, Inc.
Appendix B

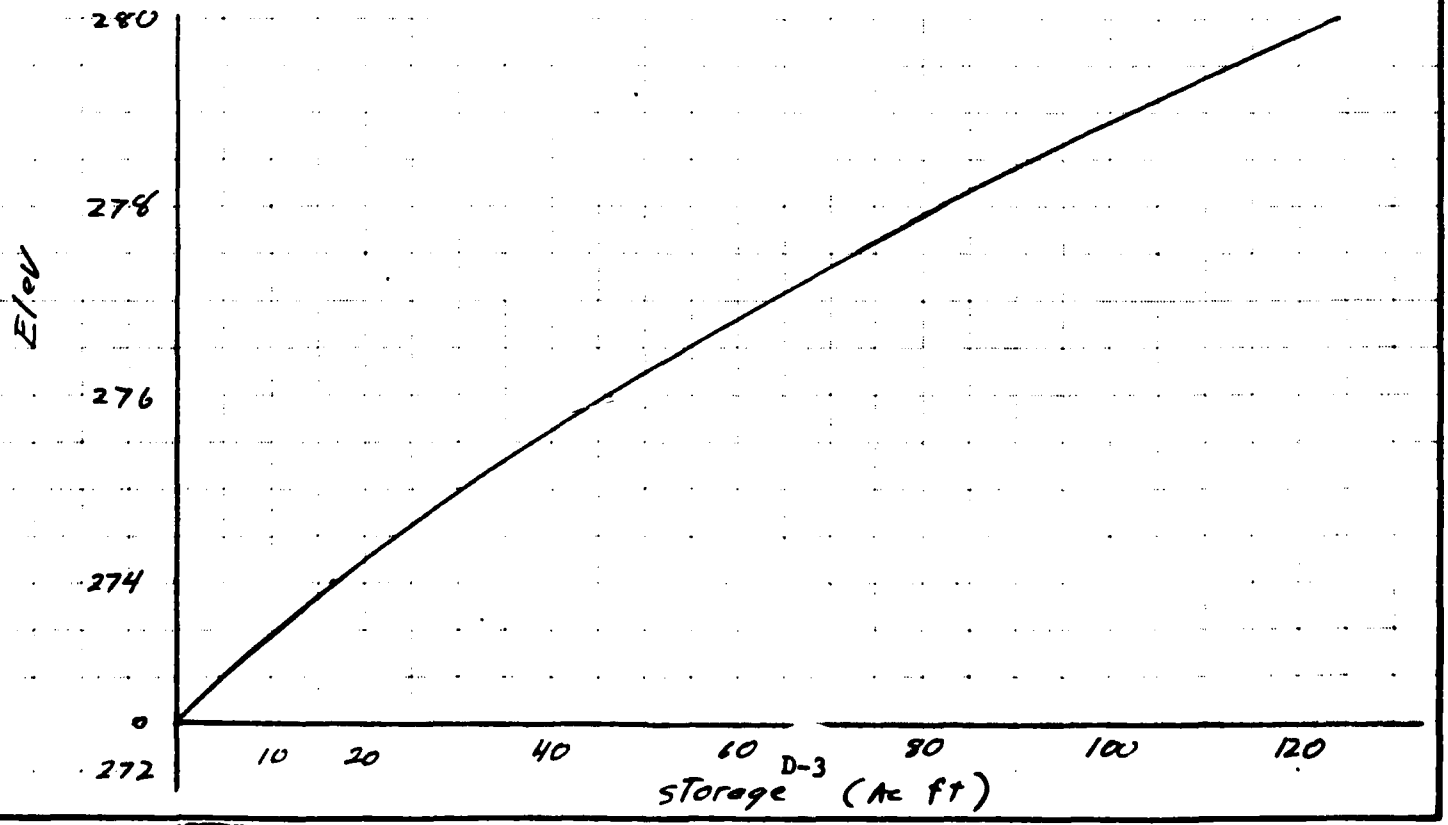
STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

JOB Phase I Dam Inspection 4463
SHEET NO _____ OF _____
CALCULATED BY KJP DATE 4/9/80
CHECKED BY CLC DATE _____

AREA - CAPACITY

Name of Dam: SHELTON RES. #2

ELEV	DEPTH	AREA	AVG. AREA	VOL	Σ VOL
272.5	0	8.51 AC	0		0
	.5				
	1.0				
274.0	1.5	13.23	10.87	16.3	16.3
	2.0				
	2.5				
	3.0				
276.0	3.5	16.64	14.93	29.9	46.2
	4.0				
	4.5				
	5.0				
278.0	5.5	19.24	17.94	35.9	82.1
	6.0				
	6.5				
	7.0				
280.0	7.5	22.67	20.96	41.9	124.0



STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

JOB Phase I Dam Inspection - #4463
SHEET NO _____ OF _____
CALCULATED BY GJG DATE 6/27/80
CHECKED BY BDC DATE 2/20/80
Downstream Hydrographs

"Rule of Thumb" Guidance for Estimating Downstream Failure Hydrographs

NAME OF DAM Shelton Reservoir No. 2 Dam

Section I at Dam

1. $S = \frac{109}{}$ Acft
2. $Q_{P1} = 8/27\ W_b \sqrt{g}\ Y^{3/2} = 8/27\ 410\sqrt{32.2}\ 23^{1.5} = 7120$ cfs
3. See Sections

Section II at

4a. $H_2 =$ 8.25' $A_2 =$ 340 SF $L_2 =$ 1400' $V_2 =$ 109 Acft

b. $Q_{P2} = Q_{P1}(1-V_2/S) =$ 6680 cfs

c. $H_2 =$ 8.0' $A_2 =$ 320 SF

$A_A =$ 330 SF $V_2 =$ 10.6 Acft

$Q_{P2} = 7120(1 - 10.6/109) = 6700$ cfs

Section III at

4a. $H_3 =$ 8.0' $A_3 =$ 320 SF $L_3 =$ 1500' $V_3 =$ 110 Acft

b. $Q_{P3} = Q_{P2}(1-V_3/S) =$ 5950 cfs

c. $H_3 =$ 7.9' $A_3 =$ 310 SF

$A_A =$ 315 SF $V_3 =$ 10.9 Acft

$Q_{P3} = 6700(1 - 10.8/98.4) = 5965$

Section IV at

4a. $H_4 =$ _____ $A_4 =$ _____ $L_4 =$ _____ $V_4 =$ _____ Acft

b. $Q_{P4} = Q_{P3}(1-V_4/S) =$ _____ cfs

c. $H_4 =$ _____ $A_4 =$ _____

$A_A =$ _____ $V_4 =$ _____ Acft

$Q_{P4} =$

STORCH ENGINEERS
Engineers - Landscape Architects
Planners - Environmental Consultants

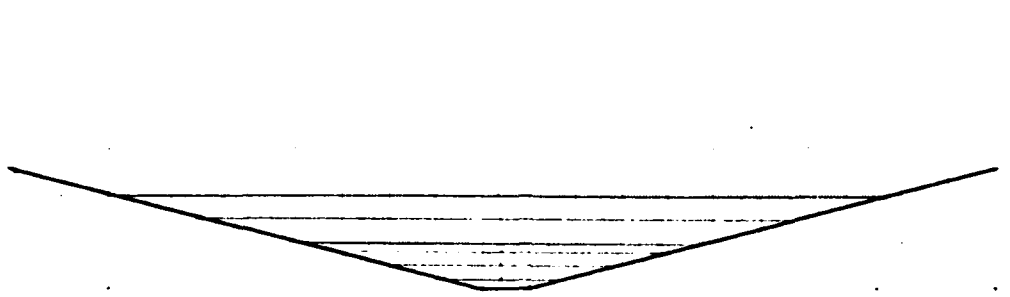
JOB _____

SHEET NO _____ OF _____

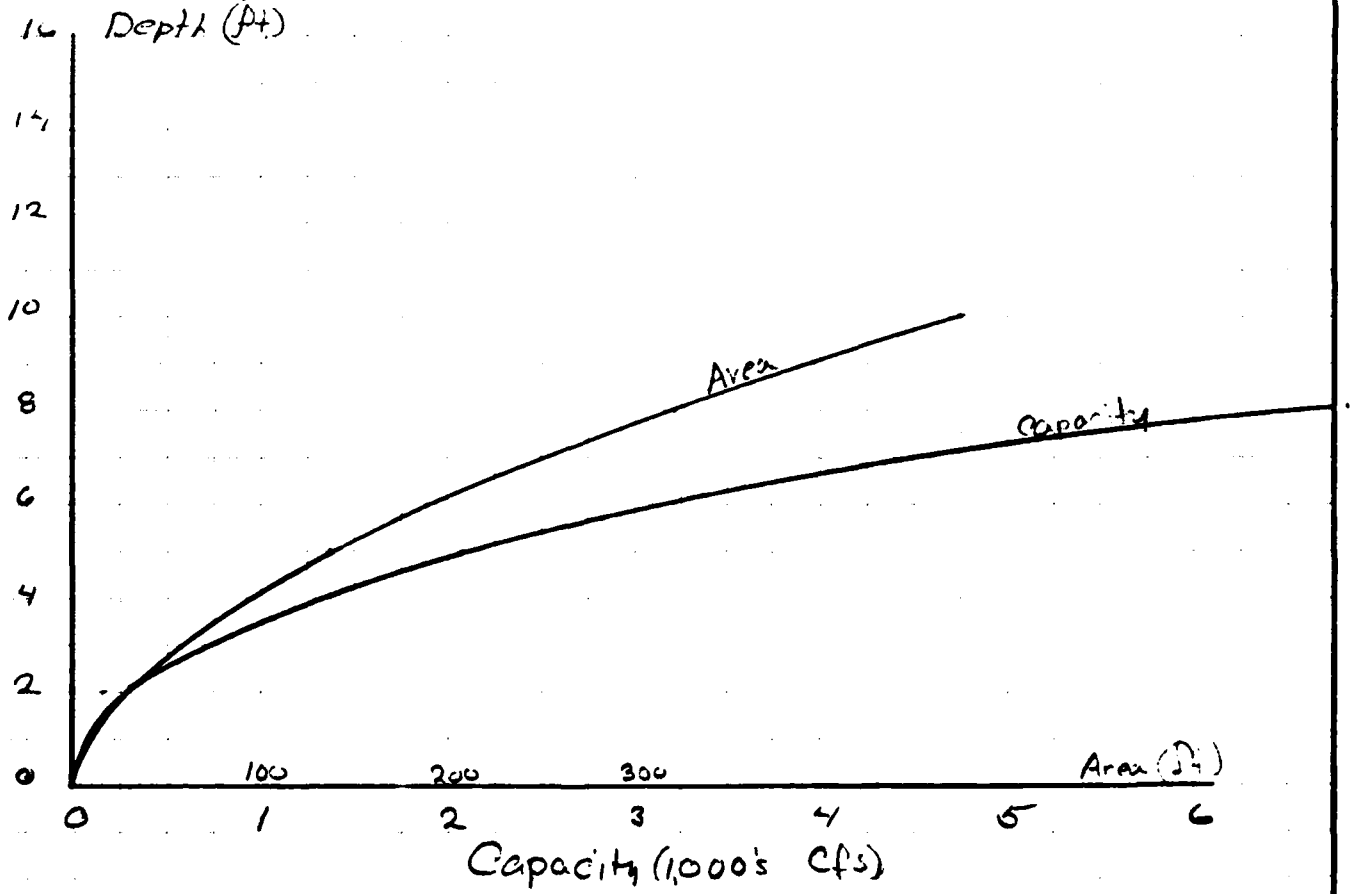
CALCULATED BY _____ DATE _____

CHECKED BY _____ DATE _____

SCALE _____



D	WP	A	R	$R^{2/3}$	$S^{1/2}$	V	Q
2	24	80	1.25	1.16	.26	9.1	273
5	50	137	2.74	1.96		15.1	2075
8	70	320	4.57	2.76		21.3	6824
10	90	475	5.27	3.0		23.5	11190
15	130	1010	7.76	3.9		30.1	30440
20	170	1750	10.3	4.76		36.6	64100



APPENDIX E

INFORMATION AS CONTAINED IN

THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

(1) STATE	(2) IDENTITY NUMBER	(3) DIVISION	(4) STATE	(5) COUNTY	(6) CONGR DIST.	(7) STATE	(8) COUNTY	(9) CONGR DIST.	(9) NAME	(10) LATITUDE (NORTH)	(11) LONGITUDE (WEST)	(12) REPORT DATE DAY | MO | YR
CT	93	NED	CT	001	05				SHELTON RESERVOIR NO 2	4119.0	7306.5	17SEP80

(13) POPULAR NAME	(14) NAME OF IMPOUNDMENT
	SHELTON RESERVOIR NO 2

(15) REGION	(16) BASIN	(17) RIVER OR STREAM	(18) NEAREST DOWNSTREAM CITY–TOWN–VILLAGE	(19) DIST FROM DAM (MI.)	(20) POPULATION
01	10	CURTISS BROOK	SHELTON	0	27900

(21) TYPE OF DAM	(22) YEAR COMPLETED	(23) PURPOSES	(24) STRUCTURAL HEIGHT (FT.)	(25) HYDRAULIC HEIGHT (FT.)	(26) IMPOUNDING CAPACITIES MAXIMUM (ACRE–FT.)	(27) NORMAL (ACRE–FT.)
MECH	1900	S	23	23	109	54

DIST	OWN	FED R	PRV/FED	SCS A	VER/DATE
NED	N	N	N	N	

(28) REMARKS

(29) O/S MAS	(30) SPILLWAY CREST LENGTH	(31) TYPE	(32) WIDTH (FT.)	(33) MAXIMUM DISCHARGE (FT.)	(34) VOLUME OF DAM (CY)	(35) POWER CAPACITY INSTALLED (MW)	(36) PROPOSED (MW)	(37) NO.	(38) NAVIGATION LOCKS LENGTH (FT.)	(39) WIDTH (FT.)	(40) LENGTH (FT.)	(41) WIDTH (FT.)	(42) LENGTH (FT.)	(43) WIDTH (FT.)	(44) LENGTH (FT.)	(45) WIDTH (FT.)
1	150		32	535												

(46) OWNER	(47) ENGINEERING BY	(48) CONSTRUCTION BY
BRIDGEPORT HYDRAULIC CO	UNKNOWN	UNKNOWN

(49) REGULATORY AGENCY			
DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	CT DEP	CT DEP

(50) INSPECTION BY	(51) INSPECTION DATE DAY | MO | YR	(52) AUTHORITY FOR INSPECTION
STORCH ENGINEERS	10JUN80	PL 92-367

(53) REMARKS

END

FILMED

8 -84

DTIC